

CLAIMS

We claim:

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1. A composition comprising a complex of a first single stranded nucleic acid and isolated Rad52 protein from a higher eukaryote.

2. A composition according to claim 1 wherein said complex is capable of mediating the annealing of said first nucleic acid to a complementary second single stranded nucleic acid.

3. A composition according to claim 1 wherein said Rad52 protein is a mammalian Rad52 protein.

4. A composition according to claim 1 wherein said Rad52 protein is a human Rad52 protein.

IND B

5. A composition according to claim 1 further comprising a second single stranded nucleic acid complexed with isolated Rad52 protein from a higher eukaryote.

6. A composition according to claim 5 wherein said second nucleic acid is complementary to said first nucleic acid.

7. A composition according to claim 1 further comprising a double stranded nucleic acid comprising second and third single stranded nucleic acids, wherein both said first and said third nucleic acids are complementary to said second nucleic acid.

8. A method of making double stranded nucleic acid comprising contacting:

- a) a first single stranded nucleic acid;
- b) a second single stranded nucleic acid, wherein said first and second nucleic acids are complementary; and
- c) isolated Rad52 protein from a higher eukaryote;

under conditions whereby said Rad52 mediates annealing of said first and second nucleic acids.

9. A method according to claim 8, wherein one or both of said nucleic acids are complexed with said isolated Rad52 protein prior to said contacting.

10. A method according to claim 8, wherein said annealing is done in the absence of Mg^{12} and cofactors.

11. A method of accomplishing strand exchange comprising contacting:

- a) a first single stranded nucleic acid;
- b) a double stranded nucleic acid comprising second and third single stranded nucleic acids, wherein both said first and third nucleic acids are complementary to said second nucleic acid; and
- c) isolated Rad52 from a higher eukaryote;

under conditions whereby said Rad52 mediates the annealing of said first nucleic acid to said second nucleic acid, such that said third nucleic acid is displaced.

12. A method according to claim 11 wherein any or all of said nucleic acids are complexed with said Rad52 prior to said contacting.

13. A method according to claim 11, wherein said annealing is done in the absence of Mg^{12} and cofactors.

14. A method of screening for a bioactive agent involved in homologous recombination comprising:

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133

a) contacting:

- i) a candidate bioactive agent;
- ii) a first single stranded nucleic acid; and
- iii) isolated Rad52 protein from a higher eukaryote; and

b) screening for binding of said candidate and said Rad52 to said nucleic acid.

15. A method according to claim 14 wherein said first nucleic acid and said isolated Rad52 are complexed prior to the addition of said candidate agent.

16. A method of screening for a bioactive agent involved in homologous recombination comprising:

a) adding:

- i) a candidate bioactive agent;
- ii) a first single stranded nucleic acid; and
- iii) isolated Rad52 protein from a higher eukaryote

to form a mixture; and

b) screening said mixture for altered biological activity, when compared to the biological activity of said composition in the absence of said candidate.

17. A method according to claim 16 wherein said first nucleic acid and said isolated Rad52 are complexed prior to the addition of said candidate agent.

col 1 of sheet 33

125
B4

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